REMARKS

ON

MORBID RETENTIONS

OF

URINE.

BY

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Ne illud quidem physici est, credere aliquid esse minimum.
CICERO. DE FIN. BONOR. & MALOR.

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TO

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IN LONDON,

THE

FOLLOWING PAGES ARE INSCRIBED

AS A TRIBUTE OF

GRATITUDE, FRIENDSHIP, AND ESTEEM,

BY HIS FAITHFUL,

AND OBEDIENT HUMBLE SERVANT,

THE AUTHOR.

PREFACE.

IT was my intention to have poſtponed to a future period the publiſhing of the following Remarks, in hopes by farther obſervation to have rendered them more full and ſatisfactory. But the opinions of ſome reſpectable profeſſors of our Art, have induced me to take a different reſolution. Indeed, if it be true, that my paper contains ſome uſeful hints, the more early they are communicated, the greater will be the probability of its conducing to the public good.

I have

I have confined my remarks to what is the reſult of my own experience and obſervation, chuſing rather to treat my ſubject imperfectly, than to have recourſe to a multitude of quotations.

I do not propoſe to give a complete account of the methods of cure of Retentions of Urine. Had I undertaken that taſk, I muſt have traverſed a very wide field, and have particularly conſidered a variety of circumſtances which are connected with the ſubject before me, and which may retard the reſtoration of the patient to his perfect health; for inſtance, fiſtulæ in perineo, ſtrictures of the urethra &c.—I have little more in view than to explain what is to be done for the immediate preſervation and preſent relief of the patient.

The

The ſketch which is given of the ſtructure and phyſiology of the bladder and urethra may appear extremely trifling to adepts in anatomy; but will render the ſubſequent ſections more intelligible to thoſe who are little verſed in that ſcience.

I have omitted details of the caſes, from which I drew my obſervations, from a belief that they would anſwer no other purpoſe than that of multiplying pages.

Upon the whole, if unfortunately the reader ſhould experience little ſatisfaction from this publication, its brevity will preſerve me from the reproach of having greatly treſpaſſed upon his time and patience.

REMARKS

ON

Morbid Retentions of Urine.

SECT. I.

EVERY improvement, however trifling, in an art of ſo much importance as Surgery, in leſſening the natural evils of mankind, is an object in every reſpect worthy to engage the attention of the philoſopher, and of the man.

This conſideration induces me to offer to the public a few obſervations, which, I flatter myſelf, will not prove altogether uſeleſs, on a diſeaſe always diſtreſſing, frequently dangerous, and not uncommonly fatal.

No part of the practice of surgery is attended with greater difficulty than the treatment of the diseases of the bladder and urethra; the true nature of them is often extremely obscure; and when discovered, it is not easy to direct the proper means of relief.

I make use of the term Morbid Retention in preference to the ordinary one of suppression of urine, because it more particularly expresses the nature of the disease; for the latter term is more vague, and may be extended to the secretion itself; while the former implies, that the kidnies have done their office of secreting the urine, but that this fluid cannot be expelled, on account of some impediment being formed to its passage out of the body.

To obtain a clear idea of any local affection it is necessary, that we should previously inform ourselves of the structure and physiology

logy of the parts, which are the ſeat of the diſeaſe in queſtion.

The ſeat of urine, morbidly retained, may be either the ureter and the pelvis of the kidney, or the bladder, and urethra.

We ſometimes find a ureter enlarged to a prodigious ſize, as well as the pelvis of the correſponding kidney, from the deſcent of the urine into the bladder being obſtructed by a ſtone lodged in the inferior portion of the ureter.

Theſe parts have been likewiſe found very much dilated with urine, when an uncommon quantity of that fluid has been accumulated, and involuntarily retained in the bladder.

But as the ſurgeon's art is incapable of immediately relieving affections of the ureters and kidnies, we ſhall decline taking any further no-

tice of them, and confine our obſervations to the bladder and urethra,

SECT. II.

THE bladder is a bag made up partly of muſcular fibres, and partly of cellular ſubſtance, with a due ſupply of blood-veſſels, nerves, and abſorbents. Its irritability is conſiderable; its ſenſibility not very acute; but both may by diſeaſe be encreaſed to the moſt exquiſite degree.

It terminates in the urethra, which paſſes through the proſtate gland, is continued from thence along the perineum, and lower parts of the penis, until it makes an opening in the glans.

As the bladder is a receptacle of a fluid often highly ſtimulating, and the urethra is a canal through which that fluid is to be conveyed

veyed in its paſſage out of the body, it is neceſſary that the internal ſurface of theſe parts ſhould be defended with mucus.

In the bladder this is ſecreted by veſſels opening upon its ſurface; in the urethra, partly by veſſels opening upon its ſurface, and partly in the lacunæ of the urethra, which may be conſidered as receptacles in which the exhaling veſſels depoſit their mucus.

Theſe lacunæ, it may be right to obſerve, are admirably well conſtructed for the purpoſe they are to anſwer; their orifices are turned obliquely towards the opening of the urethra in the glans; ſo that the preſſure of a ſtream of urine drives the mucus before it out of the lacunæ into the common canal of the urethra.

The urethra has a conſiderable degree of muſcular power; its irritability is very great; its ſenſibility is infinitely greater than that of the bladder.

It

It muſt be evident, that I have hitherto been ſpeaking of the male urethra.

The female urethra is very ſhort, and has no proſtate gland; it is much more capacious than that of the male. Sometimes in retentions of urine, eſpecially thoſe which occur in the early months of pregnancy, its diameter will be greatly leſſened, inſomuch, that it will with difficulty admit a ſmall male catheter; and its length will be conſiderably encreaſed. By diſeaſe it may become extremely irritable and ſenſible; but in a natural ſtate it ſeems much leſs ſo than the male urethra.

SECT. III.

THE ureters opening obliquely within the bladder diſtil into it the urine *guttatim*, ſo that the diſtention of the bladder goes on inſenſibly. When a certain quantity is accumulated, a ſenſe of uneaſineſs in the part is perceived. The bladder

bladder being muſcular is excited to contract; the abdominal muſcles, and ſometimes thoſe ſubſervient to inſpiration, ſympathiſing with it aſſiſt its contractile powers by making a preſſure upon its external ſurface; and the retentive powers, which we ſhall hereafter ſpeak of, giving way, the urine is expelled through the canal of the urethra, and the bladder then contracts within ſo ſmall a ſpace that its cavity is almoſt obliterated.

This evacuation of the urine is an operation partly voluntary, and partly involuntary.

The contractile power of the bladder is altogether independent of the will, but we can aſſiſt it by voluntary action with the muſcles of the abdomen, and of inſpiration; yet the power of ſympathy, between the bladder and thoſe muſcles, is ſometimes ſo ſtrong, that they will fall into action, although not excited by the will, and even contrary to its impulſe.

That

SECT. IV.

TO complete this brief account of the anatomy and phyſiology of the bladder, let us enquire by what means the urine is retained in the bladder, while all the parts preſerve their natural ſtructure and health.

Whoever examines the bladder anatomically, will be ſatisfied that near the opening of it into the urethra, its muſcular ſtructure is more evident, the faſciculi are ſtronger and ſeem to take a circular figure, but that a diſtinct ſphincter muſcle is not to be traced by the niceſt diſſection. We may properly enough conſider the bladder as one hollow muſcle, the fibres of which run in every direction. Now, we know, that different, and even oppoſite actions, are performed by different parts of the ſame muſcle. In conformity with this idea, we readily conceive, that, when the muſcular

cular fascículi at the neck or mouth of the bladder contract, then the urine will of necessity be retained in the bladder; but when the muscular powers of the body of the bladder produce contraction, if the muscular fascículi about the opening of the bladder into the urethra do not make too strong a resistance, that then the urine will be thrown out, provided there be no obstruction in the urethra.

But there is also another power, which concurs in producing the retention of the urine; and that is the contraction of the urethra. This canal, as we observed in §. 2. has a muscular power, and can therefore spontaneously lessen its dimensions.

Every man, who has been accustomed to the passing of catheters, or bougies, must be convinced of this; for he frequently finds the urethra embracing the instrument so closely,

 that,

that, without more than uſual force, it is not to be withdrawn. The urethra contracting itſelf muſt afford additional means of retaining the urine in the bladder, 'till a quantity is accumulated, too great to be longer endured, without inconvenience; and then the expulſive powers beginning to act, and the retentive giving way, a ſtream of urine is continually thrown off, 'till the bladder ceaſes to contract.

That the urine may be properly and regularly evacuated, the dilatation of the urethra muſt be ſynchronous with the contraction of the bladder, and muſt be in proportion to the force and velocity with which the bladder contracts.

SECT. V.

HAVING ſo far inveſtigated the ſtructure and functions of the bladder, let us proceed to ſpeak

ſpeak of the cauſes of Morbid Retentions of Urine, and of the proper modes of treating them.

It is not my intention to give a compleat account of the ſubject I have choſen; for I profeſs to go no farther into it, than my own experience and obſervations have led me.

Preternatural Retentions of Urine may be partial or total, and may ariſe from either of the following cauſes:

(*a.*) A want of tone in the muſcular fibres of the body of the bladder; by which it will be deprived of the power to contract.

(*b.*) A paralytic affection of the bladder; in which caſe, it will not receive a diſpoſition to contract.

(*c.*) An

(*c.*) An inflammation, or ſpaſm of the muſcular faſciculi, which ſurround the opening of the bladder into the urethra.

(*d.*) The canal of the urethra being rendered incapable of dilatation, by

Inflammation,
Spaſm,
Striƈture, or
Preſſure.

(*e.*) An extraneous body, as a ſtone, lying upon the opening of the bladder, or lodged in the urethra.

(*f.*) There is alſo another cauſe of Retention of Urine, of which I have ſeen two fatal inſtances; this is a burſting or laceration of the coats of the bladder.

For the ſake of preciſion, we will conſider the Retention produced by each of theſe cauſes as a different ſpecies of the diſeaſe.

SECT.

SECT. VI.

THE diminution of the tone of the bladder (*a.*) is almoſt always brought on by an accumulation of urine producing a very great diſtention of its coats.

The leſs ſenſible the bladder may have been rendered, or the more it may have been weakened by former complaints, the more liable it will be to fall into this ſtate: for it muſt be evident, that the leſs ſenſible it is, the more backward it will be in giving intelligence to the animal of the neceſſity to evacuate the urine contained in it. Hence it will ſuffer its coats to become ſo much diſtended, that they will at length loſe the power of overcoming the reſiſtance given by the urine. It is equally certain, that the weaker the bladder is become, the ſooner diſtention muſt ſuſpend or deſtroy its power of contracting.

From

From theſe premiſes, it will be readily underſtood, why women (of this country eſpecially) and old men, particularly thoſe who have addicted themſelves to drinking, are moſt frequently afflicted with retention from want of tone.

Women are not only in general of a weaker fibre than men, but are alſo more liable to this complaint from the delicacy prevailing among the ſex, which often induces them to bear an accumulation of urine for a length of time, at the expence of their eaſe.

Add to this, that their occupations being moſtly ſedentary, they are generally inclined to reſiſt as long as poſſible the calls of nature, rather than ſuſpend their employments.

Dr. DENMAN has fully proved, that the retroverſion of the uterus, in the early months of pregnancy, is always owing to this ſpecies of

of retention*; and which, for the moſt part, is occaſioned in the manner I have been deſcribing.

Old men, eſpecially thoſe who habituate themſelves to drinking, are more ſubject to this complaint, than thoſe of a leſs advanced period of life, from the diminiſhed ſenſibility and irritability of their bladder; and from the frequent unnatural diſtention of it, produced by the immoderate uſe of liquors, and the general cuſtom of ſitting as long as poſſible without making water.

SECT. VII.

PARALYTIC affections of the bladder, (*b.*) commonly ariſe from ſome injury done to the ſpinal-marrow, either by accident, or by diſeaſe.

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* See DENMAN'S *Introduction to the Practice of Midwifery.*

The

The too ordinary conſequence of a paralyſis of the bladder, will be a deſtruction of its tone; and then the want of a diſpoſition to act, will be complicated with a want of power.

And here the bladder, except that the living principle preſerves it from putrefaction, is nearly in ſimilar circumſtances with the bladder of a dead perſon.

The urine may go on accumulating, 'till the mere weight of the fluid has acquired a force ſuperior to that of the reſiſtance made by the proportionably weakened retentive powers, and then the water will dribble away.

It is now generally ſuppoſed, that the patient is relieved from his complaint, and is rendered able to make water himſelf; but this is a miſtake: no relief is in fact obtained;

ed; the bladder remains diſtended to a great degree, and the quantity of water expelled in a given time is ſcarcely equal to that which is ſecreted in the ſame time. When the malady increaſes to this degree, it is very rarely indeed, that the bladder recovers its health.

SECT. VIII.

LET us conſider the third cauſe of Morbid Retentions of Urine, which is (*c*) an inflammation, or ſpaſm of the muſcular faſciculi ſituated round the opening of the bladder into the urethra.

It is a known law in the animal œconomy, that, when a muſcular part becomes inflamed, it is preternaturally contracted, and its mobility is diminiſhed.

We can eaſily then diſcover, how the inflammation of theſe faſciculi ſhall produce a retention of urine; for,

1ſt, The part is incapable of ſpontaneous dilatation.

2dly, By the pain produced by every effort to evacuate the urine, the abdominal muſcles are deterred from co-operating, in due time, with the involuntary muſcular powers of the bladder, which latter alone are unable to overcome the obſtructing force.

SECT. IX.

SIMILAR effects muſt follow an impediment, to the courſe of the urine, exiſting in the urethra itſelf, whether from inflammation, ſpaſm, or ſtricture, of that canal; and they are to be explained upon the ſame principles. The ſame thing will happen, if the obſtruction be

be made by the ſides of the canal being preſſed together by any tumor, as when the proſtate gland is very much enlarged *, or when any ſwelling or abſceſs is formed in either of the three corpora ſpongioſa.

SECT. X.

IT is ſcarce worth while, but for the ſake of preciſion, to ſpeak of the fifth ſpecies (*e*). Every one muſt be aware, that a ſtone, ſituated as it is there deſcribed, may prove cauſe of obſtruction; and comprehend, after what has been ſaid, the effects of ſuch a cauſe.

I will here venture to mention a cauſe of the urine being retained, which I have the authority of more than one ſurgeon of ex-

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* A very common cauſe of difficulty in voiding the urine, in old men.

perience and diſtinction, for believing the exiſtence of, although I have never ſeen an inſtance of it myſelf; which is, an excreſcence juſt at the termination of the bladder in the urethra, which, acting as a valve yielding inwards only, prevents the eſcape of the urine.

SECT. XI.

THE laſt cauſe of Retention, which I have enumerated, is a burſting or rupture of the coats of the bladder (*f*). Of this, I ſaid, I have ſeen two fatal inſtances; the firſt, of a perſon, over whoſe abdomen the wheel of a loaded carriage had been driven. The other of a man, whoſe body had been jammed between a barge and the bank of a river. In neither of theſe patients was there any wound of the common integuments.

In both caſes, a ramus of the os pubis was fractured; the ends of the bone had lacerated the

the bladder in that part, which is uncovered by the peritoneum; the patient loſt the power of bringing his thighs together, and of voiding his urine; which eſcaping through the wound in the bladder, inſinuated itſelf into the cellular ſubſtance of the lower part of the pelvis, of the ſcrotum, of the upper part of the thighs, buttocks, &c.

The catheter was repeatedly introduced, but little water could ever be drawn off.

Symptoms of general irritation ariſing deſtroyed the patients, the one in two days, the other in three.

In the firſt, the ſcrotum and the circumjacent parts became gangrenous; and on making deep ſcarifications into the cellular membrane, the urine freely ran out from the inciſions.*

SECT.

NOTES.

Diſeaſes of the uterus, beſide the retroverſion of it in its impregnated ſtate, will ſometimes occaſion very obſtinate

SECT. XII.

LET us now dwell a little upon the conſequences of theſe obſtructions to the free paſſage of the urine.

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obſtinate Retentions of Urine; the hæmorrhoids may likewiſe produce ſimilar conſequences; and in theſe caſes the Retention will not go off, till the complaints which gave riſe to it are relieved.

Inflammations and abſceſſes of the cellular ſubſtance in the vicinity of the rectum may occaſion ſimilar effects; but the Retention produced by theſe affections, will be either ſpaſmodic, or will depend upon the inflammation extending itſelf to the bladder or urethra.

Another cauſe of a Retention may be, the hernia or diſplacement of the bladder; I have never ſeen it myſelf; but will take the liberty of giving a ſhort account of it, collected from Mr. JUSTAMOND's Lectures on Surgery: —

"The

If the impediment be in the paſſage from the cavity of the bladder to the exterior orifice of the urethra, and ariſe ſuddenly, as in caſe of inflammation, or of ſpaſm, the bladder itſelf being in an healthy ſtate; the patient will very ſoon experience a deſire to make water, and the muſcular powers of the bladder will cauſe it to contract, and endeavour to overcome the re-

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" The cyſtocele or hernia of the bladder may prove a cauſe of ſuppreſſion of urine; it may be either ſimple or complicated; if ſimple, it may be diſtinguiſhed by the ſoftneſs of the tumor; by a ſenſe of fluctuation; by the abſence of the ſymptoms of a ſtrangulated gut; by a ſuppreſſion of urine, with a frequent deſire of evacuating it; by the diſappearance of the tumor upon preſſure; and by the flow of the urine from raiſing the ſcrotum, and preſſing it gently.

" If complicated with the bubonocele, the forementioned ſymptoms will be joined with thoſe of a ſtrangulated gut; and in this caſe, the bladder will lie to one ſide of, or perhaps under, the hernial ſac, between that and the ſpermatic cord."

ſiſtance given to it. This it will be unable to do; it will then exert ſtill more violent efforts, but equally unſucceſsful; and theſe will be almoſt every minute repeated, but without effect.

If the obſtructing cauſe be not ſpeedily removed either by nature, or by art, the worſt conſequences will enſue; the whole internal ſurface of the bladder will be inflamed, and afterwards fall into a ſtate of gangrene; the patient will ſuffer the moſt excruciating torture; violent ſymptoms of general irritation will come on; and the patient in a ſhort time will fall a victim to the diſeaſe.

Upon diſſection, the kidneys will often be found to have partaken of the general inflammation (ſometimes both, ſometimes one alone) and the pelvis, with the infundibula, filled with a bloody exſudation.

The

The bladder will be found thickened, and its internal ſurface diſcoloured.

The urine contained in it will be of a dark brown colour, intolerably putrid and offenſive; and ſometimes ſmall clots of blackiſh blood of a looſe texture will be ſeen diffuſed through that fluid, or lying upon the bladder. Indeed the urine drawn off during life, but late in the diſeaſe, will be extremely fœtid and diſcoloured.

SECT. XIII.

IF the obſtruction ſhould gradually become greater, and the retention at firſt be only partial, and that in a ſlight degree; then

the bladder will gradually increaſe its force of contraction, in proportion to the increaſe of the reſiſtance.

The violence of the action of all involuntary muſcles is increaſed in proportion to the reſiſtance it meets with; and the more they are uſed, provided the living principle in them be not deſtroyed by the violence of their actions, they become more irritable and more ready to fall into action.

Thus the bladder will not at length allow of the natural degree of diſtention, before it begins to contract; becauſe it is unnaturally ſuſceptible of action: and when it does contract, it is with an increaſed force; becauſe its

its muſcular powers have been improved, and it exerts itſelf more violently to overcome the reſiſtance.

When the Retention becomes total, the bladder is placed in circumſtances like thoſe deſcribed in § 12.; but with this difference, that the bladder takes on inflammation, and the ſubſequent gangrene more ſlowly in the preſent caſe, than when the paſſage of the urine has been ſuddenly obſtructed.

In ſome caſes, in which, after a continuance of the obſtruction for two or three days, the Urine has been diſcharged, either with, or without the aſſiſtance of the catheter; I have ſeen the firſt part of the ſtream preceded by, or accompanied with, a quan-

tity of purulent matter; and the ſame circumſtance has been repeated the three or four following times of emptying the bladder.

Here I imagine that the internal ſurface of the bladder muſt have undergone a ſuppuration, as I cannot believe the pus to have been formed in the urethra; for in that caſe the matter would have been diſcharged at other times as well as in voiding the urine, and eſpecially, in ſtriving to go to ſtool.---But the truth of this opinion I have never aſcertained by diſſection.

SECT.

SECT. XIV.

WHEN the Retention ariſes from a paralyſis or atony of the bladder, a prodigious degree of diſtention will be endured by that viſcus, even to its containing two or three quarts of urine, without the ſymptoms of irritation coming on, or the patient ſuffering any conſiderable pain.

I have known a woman, whoſe bladder was ſo diſtended, that her abdomen appeared like that of a perſon far advanced in pregnancy, walk nearly a mile for advice; and who ſuffered ſo little uneaſineſs in her bladder,

der, as not to have the leaſt ſuſpicion of the cauſe of the tumor.

A ſurgeon will readily diſtinguiſh ſuch a ſwelling of the abdomen from pregnancy, and from aſcites ; from the former by the very evident fluctuation, as well as by an examination taken *per vaginam*; from the latter, by the tumor being circumſcribed; and from both, by the hiſtory of the diſeaſe given by the patient.

If this kind of Retention continues for a length of time then the retentive powers alſo will become weakened, and the urine will dribble away. For an explanation of this phænomenon, ſee § 7.

It

It is not unuſual in this ſpecies of the diſeaſe for the urine to be diſcharged of a wheyiſh colour; this is probably owing to an alteration in the ſecretion of the mucous membrane of the bladder, and the matter ſecreted having blended itſelf with the urine.

We may obſerve a material difference between the effects of this ſpecies of Retention, and of that deſcribed in the two preceding ſections.

For ſuppoſing the patient to remain a length of time without relief, and then the urine to be drawn off by the catheter, or to dribble away, its fœtor and diſcolouration will be leſs than in the other ſpecies.

Symp-

Symptoms of irritation do not appear, or do not riſe at leaſt to any remarkable height. If the patient is ultimately deſtroyed by the diſeaſe, he ſeems to die from weakneſs, exhauſted, and worn out by a kind of hectic.

In the other ſpecies the tongue is always dry, hard, and rough like a file, and generally covered almoſt to the very edge with a dark brown cruſt. But in this, the tongue is not in general furred, wants the browniſh cruſt, is ſometimes moiſt, and if dry, is ſtill ſmooth.

In the others, the diſeaſe, if not relieved, is fatal in a few days. In this the patient

tient may live for many weeks, his urine in the mean time continually dribbling from him.

In the former, the patient's body will have a ſtrong urinous ſmell from the abſorbents of the bladder taking up the fœtid urine, and carrying it into the blood, from which it is again ſeparated in the different ſecretions. In this ſpecies, if proper attention be paid to cleanlineſs, the fœtor is little if at all perceptible; becauſe the urine is in itſelf leſs fœtid, and the lymphatics (here weakened in common with all the other parts of the bladder) are leſs active in abſorbing it.

The former, probably, never proves fatal without coma, alienation of mind, and other affections of the nervous ſyſtem.

SECT. XV.

IF the Retention from a ſtricture in the urethra (§ 8.) ſhould continue for ſome time without the obſtruction giving way, the urine being drawn off, or the ſymptoms of irritation or a gangrene deſtroying the patient; it is not uncommon for an ulceration of the urethra to ariſe in the part which is the ſeat of the ſtricture; and the urine inſinuating itſelf into the cellular ſubſtance of the perineum and ſcrotum, to produce inflammation,

mation, ſuppuration, and ultimately what are called fiſtulæ in perineo.

SECT. XVI.

PRESUMING I have taken a ſatisfactory, though a brief, ſurvey of the hiſtory of Retentions of Urine, let me now offer what hints I think will conduce to the proper treatment of the diſeaſe.

SECT. XVII.

THAT the Surgeon may avoid miſtakes, it will be neceſſary that he fully inform himſelf of the hiſtory of the diſeaſe from its firſt commencement; for greatly indeed muſt

the treatment differ in the different ſpecies of Retention.

When the complaint ariſes from atony or paralyſis (§ 5. *a*. *b*. § 7. 8.) it would be with me a decided maxim, always to have the earlieſt recourſe to the catheter, at what period of the diſeaſe ſo ever I might be called in, having no reliance either on nature or medicine, unleſs that inſtrument be previouſly introduced.

I ſhould alſo, from what I have ſeen of the utility of the plan, be led to repeat the uſe of the catheter three, four, or five times in twenty-four hours. For the bladder ſhould by no means be ſuffered to be diſtended even

to

to that degree which was cuſtomary in time of health. It ſhould be habituated to contract frequently, or at leaſt to be brought into that ſtate, which is as like to contraction as poſſible.

As for what is to be done beſide the uſe of the catheter; the Cold bath, or if the bath be objected to, throwing cold water with force upon the abdomen of the patient; rubbing the region of the bladder often with ſome ſtimulating liniment; clyſters compoſed of ſubſtances, which ſpecifically ſtimulate the urinary paſſages, joined with ſuch internal remedies * as the phyſician may think expedient,

* Of theſe, the Tincture of Cantharides ſhould ſeem to promiſe the greateſt advantages from its ſpecifically

expedient, will probably form the moſt promiſing plan of a cure.

A theory founded upon rational principles has led practitioners, in caſes of atony and of paralyſis of the bladder, to the application of bliſters to the region of the † ſacrum; and

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ſpecifically ſtimulating the urinary paſſages. But I cannot ſay I have ſeen it remarkably ſerviceable. It is probable indeed, that little is to be expected from the ſpecific operation of any internal remedies, and that our attention muſt be directed to thoſe medicines only, which alter the ſtate of the tone and action of the ſolids in general, as for inſtance, mercury, bark, &c.

† The nerves of the bladder, excepting thoſe which it receives from the intercoſtals, are formed from the fourth ſacral nerve.

great

great advantages are ſaid to have been derived from their uſe. Hitherto I have not had the good fortune to ſee them applied with ſucceſs. The patient cannot conveniently go into the bath, while they are uſed.---But what other remedies ſo ever are recommended, we cannot enough inſiſt upon the propriety of regularly emptying the bladder with the catheter as often in twenty-four hours as ſeems to be indicated, and to perſevere in this practice, 'till the patient finds a return of the expulſive powers.

SECT. XVIII.

IF the obſtruction has ariſen ſuddenly, as in the ſpecies (§ 5. *c.*) a doſe of laudanum

and

and nitre ſhould be immediately adminiſtered and repeated in the courſe of half an hour, or an hour, if relief be not obtained. If there be ſymptoms of inflammation the patient ſhould be copiouſly bled. Let fomentations be applied to the abdomen, and emollient and gently aperient clyſters be injected. But if the impediment do not give way, we ſhould waſte no great deal of time before we proceed to the uſe of the catheter; the introduction of which, if attempted with gentleneſs, caution, and ſkill, does far leſs injury, than the continuance of the Retention. For it will commonly happen, if the bladder be once emptied in an early ſtage of the diſeaſe, that the cauſe of the complaint will ceaſe, before the bladder becomes again diſtended. It is impoſſible to

ſpecify

ſpecify the exact time a ſurgeon ſhould wait before he has recourſe to the catheter; that muſt be decided by the urgency of the ſymptoms. But I ſhould hope to appear not too haſty in adviſing that meaſure, as ſoon as the practitioner has reaſon to fear he ſhall not give his patient ſpeedy relief by any other means *.

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* That my meaning may not be miſunderſtood, I will take the liberty to remark that I adviſe the uſe of the catheter upon the preſumption only, that the ſurgeon has aſcertained the bladder to be in a ſtate of diſtention; for, few can want to be informed that very diſtreſſing ſymptoms, as violent pain, a frequent but ineffectual deſire to make water, &c. will ſometimes come on, when there is very little urine in the bladder.

Theſe ſymptoms, when they do not depend upon diſtention, cannot be alleviated by the uſe of the catheter.

The warm bath is alſo highly adviſeable, not only as a moſt powerful anodyne and relaxant, but alſo as diſpoſing the patient to a copious perſpiration. From this latter property of determining the fluids to the ſkin inſtead of the kidnies, it has a tendency to diminiſh the ſecretion by the latter.

Indeed, in all caſes whatever, where it is thought adviſeable, whether from any difficulty in the operation, or from ſome other motive, to delay the introduction of the catheter, the Warm Bath ſhould by no means be neglected; and the patient ſhould go into it as often as his ſtrength will permit; for tho' it ſhould not anſwer our end fully by occaſioning the obſtruction to give way, it will at leaſt tend to keep the diſeaſe ſtationary

nary, not only by making the accumulation of the urine gradual, but alſo by moderating the general ſymptoms of irritation. In this caſe camphor will be advantageouſly joined with the opiate recommended above, as rendering its action as a ſudorific more certain.

Should the ſymptoms of inflammation, or ſpaſm not readily give way, we may then adminiſter a ſmall doſe of emetic tartar as one of the moſt efficacious of the claſs of internal relaxants, and repeat it frequently.

SECT. XIX.

IF any thing is to be done in that lamentable caſe in which the bladder is burſt without any external wound *, I ſhould doubt whether the only poſſible reſource will not be the frequent uſe of the warm bath, opiates and ſudorifics, and in ſcarifying the cellular membrane of the ſcrotum, or any other part of the common integuments where the urine has inſinuated itſelf. Indeed ſo deplorable is the ſtate of the ſufferer, that it muſt be rather from that principle of duty, which forbids

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* See § 11.

a ſurgeon

a ſurgeon to abandon his patient 'till there be an evident impoſſibility of his recovery, than from any expectation of ſucceſs, that we ſhould exert our endeavours in his ſervice.

Let me hope, I do not propoſe an abſurd queſtion in aſking, If in ſuch a caſe we ſhould be juſtified in making the inciſion of the lateral mode of lithotomy into the bladder; and by cauſing the patient to lie on an inclined plane to render the artificial opening, a depending one, and thus endeavour, by giving a ready exit to the urine, to prevent the inſinuation of it into the cellular ſubſtance?

SECT.

SECT. XX.

WHEN an inflammation of the urethra, by whatever cauſe induced, occaſions the Retention, it will ſometimes happen, that the whole penis ſhall become ſo tenſe and ſwollen, as to appear nearly in a ſtate of erection. In this caſe the application of leeches to the penis and perineum may be added to the other remedies.

SECT. XXI.

THE management of Retentions of Urine from ſtrictures of the urethra is attended with

with greater difficulties; for beſide thoſe in common with the other ſpecies, it has alſo thoſe peculiar to the introduction of the catheter. For the urethra may not only have its ſize diminiſhed, but its figure alſo may be altered, and its courſe rendered winding, and tortuous.

The doctrines already laid down ſeem to be ſufficient for the relief of this ſpecies of the complaint, except in what relates to

1ſt. The circumſtances of paſſing the catheter.

2dly, To the urine being retained, after we

we have ſucceeded in the introduction of the inſtrument, and

3dly, To the methods to be adopted, when we are foiled in our attempts to introduce it.

Let us ſuppoſe, that the Surgeon, after having unſucceſsfully employed ſuch remedies as the preceding pages, and his own reaſon, and experience, ſhall have ſuggeſted to him, becomes ſatisfied in his mind, that it is time to evacuate the urine by art. He will then endeavour to paſs the common catheter; and if he finds an impediment to its progreſs, he will not uſe force to break through the obſtruction for fear of making an unnatural paſſage, but withdraws his inſtrument

ment and tries a ſmaller, but without effect. Let us then ſuppoſe him equally unſucceſsful in his attempts with bougees even of the ſmalleſt ſize.

This queſtion naturally ariſes; What farther means can the *hand* of the practitioner employ for the relief of his patient?

I will venture to mention an expedient, which experiment juſtifies me in recommending.

We are unſucceſsful in our attempts to relieve our patient, becauſe neither the catheter nor bougee poſſeſs a ſufficient degree of flexibility, joined with a ſufficient degree of ſtrength, ſo as to enable us to uſe force

without injury to the patient. For if we can once paſs a bougee into the bladder, we ſhall rarely, if ever, fail of accompliſhing in the end the evacuation of the urine.

I am convinced from repeated trials, that a great deal may be done under the circumſtances we have been juſt ſpeaking of, by a column of olive oil.

I will be particular in deſcribing the manner of uſing it.

Take the penis in one hand, and with a ſmall ſyringe throw into the urethra ſome recent olive oil, 'till a conſiderable reſiſtance be given to the piſton of the ſyringe, and the

the urethra ſhall feel tenſe; cloſe the urethra by compreſſing the penis near its glans between a finger and thumb, and then with the other hand ſtroke the penis upwards, that is towards the ſcrotum, ſo as to force onwards the column of oil already thrown in. As ſoon as the lower part of the urethra is become leſs tenſe, inject the oil again, and ſtroke the penis in the manner already deſcribed; repeat this once or twice more, and then try a ſmall bougee, which will now probably paſs; afterwards a larger, and then a larger; and ſo on, 'till the urethra be ſufficiently dilated to allow of the introduction of a catheter.

Here let me obſerve, that a large bougee will ſometimes paſs, when we can make no pro-

greſs with a ſmall one probably from its point being entangled in ſome fold of the urethra.

We ſhould allow every bougee to remain ſome time in the urethra before we withdraw it, and attempt to paſs a larger or to introduce a catheter.

In caſes of ſpaſm where the immediate introduction of the catheter has been impracticable, a bougee remaining for fifteen or twenty minutes in the urethra, has induced ſuch a change in the ſtate of that canal, that the patient has been enabled to make water without farther aſſiſtance.

If the urethra be rendered tortuous by the ſtrictures, it is probable, notwithſtanding we

we may have procured a conſiderable dilatation by the means already deſcribed, that a ſilver catheter cannot be introduced. In this caſe great advantages may accrue from the elaſtic flexible catheters made of the Caoutchac, or elaſtic vegetable ſubſtance, which were lately invented in Paris, and are now to be purchaſed of the inſtrument makers in London. They are flexible and compreſſible every way, and may be paſſed whenever a moderate ſized bougee can be uſed. After the uſe of the oil and bougees, the Surgeon will have recourſe to a catheter of this kind*, if the urethra will not admit a ſilver one.

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* I paſs over the flexible metal catheters, becauſe their uſe is entirely ſuperſeded by thoſe made of Caoutchac.

The oil anſwers two purpoſes; firſt that of an extremely flexible bougee which will adapt itſelf to a canal of any ſize, and to which we can alſo give the property of ſtrength, by the force we apply a tergo: and ſecondly, that of an emollient and relaxant of the urethra, lubricating all its internal ſurface, and thus facilitating the paſſage of the inſtruments afterwards to be employed.

Indeed, whenever the introduction of a catheter or a bougee is found in the leaſt difficult, it is better that it ſhould be withdrawn, and the oil injected, before we repeat our attempt.

When we have puſhed the catheter into the bladder, and drawn off the urine, it is a queſtion

queſtion whether we ſhould ſuffer the catheter to remain in the bladder, or withdraw it immediately.

If a ſilver catheter has been uſed, it ſhould be changed for a bougee; but in retentions from ſtricture, I ſee no objection that can be made to the continuance of a caoutchac catheter in the bladder, becauſe with all the advantages of a bougee, it hath the additional one of there being no neceſſity to withdraw it and repaſs another inſtrument two, three, or four times a day. This cathether, as we have before ſaid, is flexible and compreſſible in every direction, while the ſilver one on the contrary is incompreſſible and inflexible; the latter will therefore tend to irritate and inflame the urethra,

urethra and bladder if continued in, and will not allow the patient to move his body without inconvenience; but with the elaſtic vegetable catheter in the ſame ſituation, he may even walk about.

Before we ſuffer any forreign body to remain for a length of time in the bladder, we ſhould firſt inquire whether the patient be ſubject to calculous complaints; for if this ſhould be the caſe, a ſtoney incruſtation may in a day or two be formed round the part of the catheter or bougee that remains within the bladder, and prove an obſtacle to our endeavours to remove it.

If, however, we reſolve to let the caoutchac catheter remain, we ſhould place a cork in the

the mouth of the inſtrument; withdrawing it at proper intervals of time, ſo as juſt to anticipate a ſenſe of pain from diſtention of the bladder, and thus imitating as much as we can the actions of nature.

SECT. XXI.

IT ſometimes happens, after the catheter has been introduced into the bladder, that there is a difficulty in making the urine flow, although the bladder be then in a diſtention; at other times the urine will ſtill be totally retained *.

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* The preſent Profeſſor Gregory of Edinburgh, takes notice of this circumſtance,

—— "*Ita ut ne quidem immiſſo tubulo ad educendam urinam, hæc profluat.*

Conſpect. Medicin. Theoret. Sect. 733.

The cauſe of this diſappointment may be either, firſt a partial or total loſs of power in the bladder to contract. Or,

2dly, Clots of blood, mucus, &c. obſtructing the holes or eyes of the catheter. Or,

3dly, Both theſe cauſes may exiſt at the ſame time.

SECT. XXII.

IN order to underſtand how theſe cauſes § 21. can operate in producing their effects, it is neceſſary that we previouſly conſider the principles upon which the evacuation of the urine by the catheter depends.

Theſe

Theſe are, firſt, the power of the bladder to contract upon the urine, and thus force it through the unobſtructed canal of the catheter; or, 2dly, the urine running off, independent of any action in the bladder, and merely upon hydraulic principles.

A paralytic bladder, or a bladder which has loſt its power of contracting is nearly in the ſame condition with that of a dead perſon. It may be in a ſtate of diſtention, we may have introduced our catheter; but, if the patient do not lye in a poſition favourable to the eſcape of the fluid, the urine will not flow.

We are then in a dilemma, from which we endeavour to extricate ourſelves by ſhifting

the direction of the inſtrument, by changing the poſition of the patient, or by making preſſure upon the abdomen.

The latter expedient increaſes the ſufferings of the already too miſerable patient; the ſecond is often extremely diſtreſſing and fatiguing to him, and three or four aſſiſtants may be required if he ſhould be too ill to riſe, and move his body himſelf.---Even the ſhifting of the direction of the inſtrument, as by depreſſing the handle of the catheter, is frequently not to be done without giving pain. Theſe inconveniences every Surgeon muſt have experienced.

By applying the principles of Pneumatics to the practice of Surgery, I have been enabled

enabled to ſuggeſt a method of emptying the patient's bladder when ſo circumſtanced; and that without pain, or fatigue to him, trouble to the Surgeon, or the neceſſity of aſſiſtants. This is to be done by means of that ſimple machine, a pump. I have given a drawing of the one which I have uſed for this purpoſe, with an explanation annexed.

When the catheter has been introduced and we find that the water does not readily run off, the firſt circumſtance we muſt aſcertain is whether the inſtrument is in the bladder; this is to be known by examining with the finger in the rectum, and by perceiving no reſiſtance to the extremity of the inſtrument in gently turning it about as we do in ſearching for a ſtone.

The

The braſs pipe of the machine is then to be inſerted into the mouth of the catheter; the former being conical will readily adapt itſelf to the latter, even ſo as to be air tight; the penis is then to be gently compreſſed, but ſo as to make the urethra lie in cloſe contact with the catheter, and to prevent the inſinuation of the air between them. Having done this, by working with the piſton of the pump a vacuum will ſoon be made in the catheter, which the urine will ruſh into and fill, and ultimately riſe through it and the flexible tube into the glaſs receiver; as ſoon as that is full, we are to withdraw the machine; and admitting air into it by looſening the ſkrew in the braſs collar the receiver will readily be emptied. The inſtrument muſt then be replaced, and the operation repeated till the urine be entirely drawn off.

Thus

Thus the bladder is emptied by a very ſimple proceſs, with neatneſs and eaſe.

Secondly, though the bladder retain its power of contracting, coagula of blood or collections of mucus may plug up the holes, or eyes of the catheter, (whether it be the common one with ſmall holes on each ſide and with a bulbous end, or that formerly in uſe with long eyes) and thus obſtruct the eflux of the urine.

Filling the catheter with oil previous to the introduction of it, is a method which I have ſucceſsfully uſed, and which was taught me by a gentleman of deſerved reputation in his profeſſion, Mr. JEFFERIES, of Worceſter.

Fill the catheter with pure olive oil, by ſuction either with the mouth or a ſyringe, and placing a finger on the extremity of the inſtrument to prevent the eſcape of the oil, paſs it into the bladder; then withdraw your finger, and the oil will flow, generally followed by a ſtream of urine. I ſay generally, for ſometimes the clots of blood or mucus may be too large or of too firm a conſiſtence, to be forced through the catheter by the action of the bladder alone.

Thirdly, both the firſt and the ſecond cauſe may exiſt at the ſame time, and then alſo the expedient of filling the catheter with oil will be inefficacious.

But in theſe circumſtances and in all others, when the introduction of the catheter has been accompliſhed,

accompliſhed, it is ſcarce poſſible to fail with the machine which I have been already recommending.

This concluſion is drawn from various experiments made upon dead bodies, as well as from ſucceſsful trials upon the living ſubject.

One patient was in the extremity of danger; I had repeatedly introduced, with the greateſt facility, catheters of different ſizes both with holes, and with long eyes; I repeatedly tried the expedient of filling the catheter with oil, preſſure on the abdomen, change of the poſition of the patient's body, &c. but without effect. I had the good fortune however, to pump up from his bladder more than three pints of urine, and at different times, in the

courſe of the operation, large coagula of blood formed into long ropes, which nothing but the amazing power which the preſſure of the atmoſphere gave to the urine, could have forced through the catheter.

A ſecond was relieved by the ſame method.---It ſucceeded alſo in a third inſtance ſo far at leaſt as to empty the bladder; but a gangrenous ſtate of that viſcus and the general irritation of the ſyſtem, the the patient having been ill of the retention four or five days without aſſiſtance, had made his recovery impoſſible.

Beſides thoſe caſes which have fallen under my own notice, four others, in which the urine would not flow upon paſſing the catheter, have

have been communicated to me by practitioners of diſtinction.

In one the retention proved fatal, the urine never being evacuated.

Another caſe fell under the care of a worthy friend of mine in London lately deceaſed, who called in the aid of a then moſt celebrated anatomiſt. The catheter was repeatedly introduced by both gentlemen, but without ſucceſs. Fortunately the next day nature removed whatever was the obſtructing cauſe, and the urine ran off without the aſſiſtance of art.

The third was that of an elderly gentleman, who was preſerved afterwards by filling the catheter with oil as directed in this ſection.

The fourth was relieved by pumping up the urine.

Happily, caſes of this kind are but rare; but it behoves us to be prepared againſt them; for when they do occur, the patients muſt either be abandoned to their fate or ſubmit to the paracenteſis of the bladder, unleſs ſome expedient can be deviſed for the removal of the obſtacles to their relief.

Such an expedient is ſuggeſted in the method here propoſed, which ſeems to be countenanced by the ſoundeſt reaſoning. It may render a precarious and diſagreeable operation unneceſſary, and may preſerve life: at leaſt it will certainly be found upon many occaſions to leſſen trouble, to remove difficulty,

culty, and to ſhorten and alleviate the ſufferings of the patient *.

SECT. XXIII.

NEVERTHELESS, there may be Retentions of Urine in which the ſize of ſome part of the urethra may be ſo greatly di-

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* The doctrines recommended in this and the preceding ſection muſt be regarded as applicable to every ſpecies of retention, in which the difficulties, of which we have juſt been ſpeaking, ariſe. For different ſpecies of retention may be complicated with each other. Thus the bladder may want the power to contract, and at the ſame time there may be a ſtricture in the urethra; &c.

miniſhed, and the direction of the canal ſo much altered by old and confirmed ſtrictures, that no catheter of whatever ſize or faſhion can be introduced into the bladder.

Suppoſing the inſtrument in theſe inſtances, could be carried high up in the urethra, I ſhould not abſolutely deſpair of evacuating the urine by the uſe of the pump.

This I was once in hopes of being able to effect in every inſtance; but a failure in the only caſe of the kind in which I have had an opportunity of trying my machine, have rendered my expectations leſs ſanguine.

I had

I had flattered myſelf, if the urethra were not rendered totally impervious to a fluid, that I ſhould be able to draw out that fluid, as the urethra would in fact be made a continuation of the canal of the catheter. But in this I was diſappointed.

I imagine the reaſon of my failure to have been, that, when a vacuum was made in the catheter, the ſides of the urethra were compreſſed together; the preſſure of the atmoſphere operating upon them, and not upon the bladder.

But ſeveral experiments ſince made upon the dead body have taught me to believe, that it is poſſible to remedy this inconvenience by keeping the portion of the urethra above the

the ſtricture dilated by means of oil. This is effected by throwing oil up the catheter into the urethra with ſome little force, and keeping that force applied for ſome time previous to the joining of the braſs pipe to the mouth of the catheter. For this purpoſe the catheter muſt be made open at both ends, and very little curved *. For if we can keep the urethra dilated from the bladder to the part where the catheter ſtops during the time we make a vacuum, then let that

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* The mucous membrane of the urethra will be applied to, and fill up the holes or eyes in the ſides of the catheter, for which reaſon there ſhould be an opening in its point. And the catheter ſhould be very little curved; that the point of the inſtrument may not be applied to either ſide of the canal of the urethra, but take ſuch a direction, that the axis of the hole in the former may exactly correſpond with the axis of the latter.

part

part of the canal be ever ſo ſtraitened, ſtill a ſmall ſtream of fluid will come off, which, by continuing the action of the piſton, we may keep up 'till the bladder be emptied.

But I can contend for the probability only of ſucceſs from this proceſs, not for the certainty. Could the latter be depended upon, the invention would aſſuredly be an improvement of the moſt extenſive utility; becauſe retentions from old and confirmed ſtrictures, in which the catheter cannot be introduced without difficulty to the ſurgeon, and torture to the patient, occur every day.

SECT. XXIV.

IF the reader ſhould agree with me in opinion, he will apply theſe doctrines, and

this practice, as far as it will go, to Retentions from preſſure upon the urethra.

The enlargement of the proſtate gland is by no means unfrequent in old men; hence another reaſon why they are particularly ſubject to the complaint under conſideration.

Whatever may be done by way of evacuating the urine, and giving them preſent relief, I do not know of any plan of treatment, that can promiſe a cure.

Poſſibly the frequent uſe of the Hemlock bath, mercurial frictions on the perineum, and frequent endeavours to dilate that portion of the

the urethra, which paſſes through the proſtate, by injecting oil, and by the uſe of bougees, may prove beneficial. It is a melancholy caſe, but happily does not often occur, 'till that advanced period of life, which naturally leads to the grave.

SECT. XXV.

NOTWITHSTANDING all the exertions of ſkill and care to prevent the neceſſity of a paracenteſis of the bladder, yet it is to be feared, caſes will happen, in which it muſt be our laſt reſort, as giving the patient the only chance for life.

I will not take up the reader's time in deſcribing the different methods of performing

the operation, as that has been done by the labours of others *, in a manner which I cannot improve; nor ſhall I preſume to give an opinion, which of thoſe methods is moſt eligible.

I will venture however to adviſe the Surgeon, who may be diſpoſed to prefer making his wound above the os pubis, not to uſe a very ſhort trochar; becauſe, as the urine runs off, the bladder will collapſe, and

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* See SHARP's Operations, SHARP's Critical Enquiry, REID's Elements of Surgery; alſo a pamphlet publiſhed by Mr. REID, in conſequence of a diſpute on the ſubject of the puncture of the bladder through the rectum, carried on between himſelf and an anonymous writer in the Gentleman's Magazine for May, July, and Auguſt, 1777, entituled, "An enquiry into "the merits of the different methods of puncturing the "bladder."

withdraw

withdraw itſelf from the cannula of ſuch a trochar; and then the urine will inſinuate itſelf into the cellular ſubſtance of the hypogaſtrium, and produce many of the inconveniencies complained of as the conſequences of the high operation for the ſtone, ſuch as extenſive inflammations, ſuppurations, &c.

I mention this from having ſeen the paracenteſis of the bladder performed above the os pubis with a very ſhort hydrocele trochar; the conſequences were thoſe I have deſcribed; and had nearly proved fatal to the patient.

SECT. XXVI.

THE preceding Remarks, excepting what relates to the peculiarities of the male urethra, may

may be conſidered as applicable to the treatment of Retentions in women. The female urethra being wide, ſhort, and ſtraight, commonly admits of the introduction of the catheter with the greateſt facility. But it may be otherwiſe, when a retention during pregnancy is accompanied with a retroverſion of the uterus. In this caſe, as the bladder in being diſtended is obliged, by the peculiar ſituation of the uterus, to riſe higher and higher in the abdomen, the urethra is drawn upwards; its external orifice is ſcarce to be diſcovered; its canal is ſo much elongated, and its diameter diminiſhed, that a female catheter cannot be uſed. Under theſe circumſtances, as the courſe of the urethra is alſo ſomewhat altered, a male catheter made of caoutchac may be advantageouſly employed.

Tumours

Tumours of the ovaria may occaſion a difficulty in voiding the urine, and even a total retention.

In a woman, whom I diſſected laſt year, I found an hydropic ovary occupying the natural ſituation of, and reſembling in appearance, the bladder when moderately diſtended. The real bladder was thruſt to one ſide of the tumour.

But as tumours of the ovaria generally contain a fluid, and conſequently will make the leſs reſiſtance, it does not ſeem probable that they will often occaſion a difficulty in drawing off the urine by the female catheter.

I will now take my leave of the reader, with intreating him, if I appear to have handled my ſubject too briefly, or ſuperficially, to accept what is offered in my preface, as a juſt apology; and, what other faults ſoever his criticiſm may have detected and condemned in the foregoing pages, at leaſt to give me credit for a deſire to leſſen the ſufferings of humanity; and to throw one mite into the treaſury of chirurgical knowledge, which has received ſo many rich gifts from the ſeveral diſtinguiſhed writers of the preſent age.

PLATE

Fig. 2.

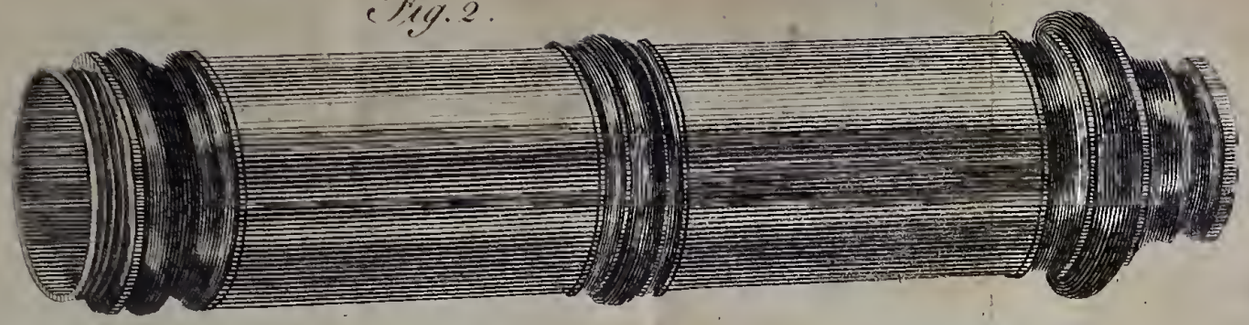


Fig. 1.

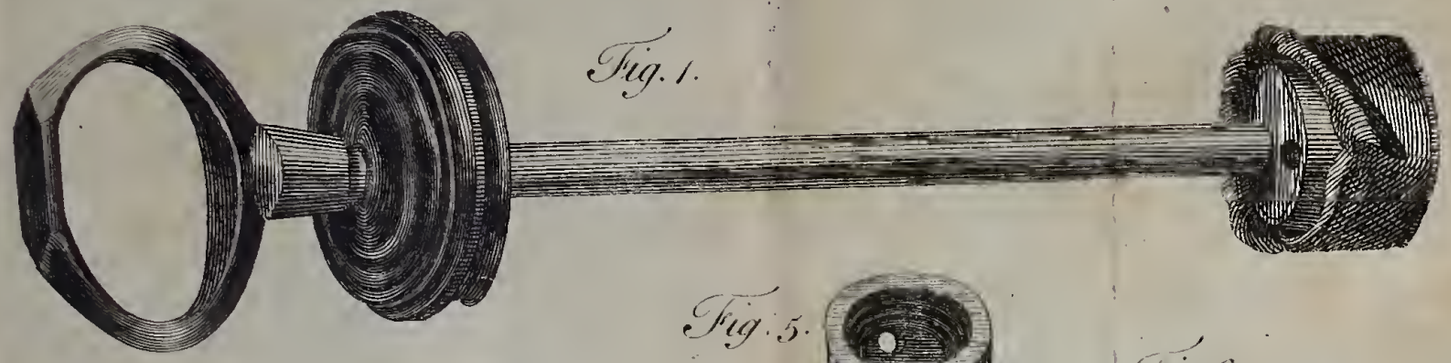


Fig. 5.

Fig. 6.

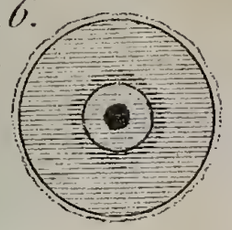


Fig. 7.

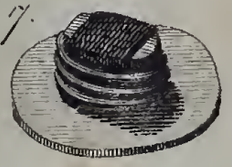
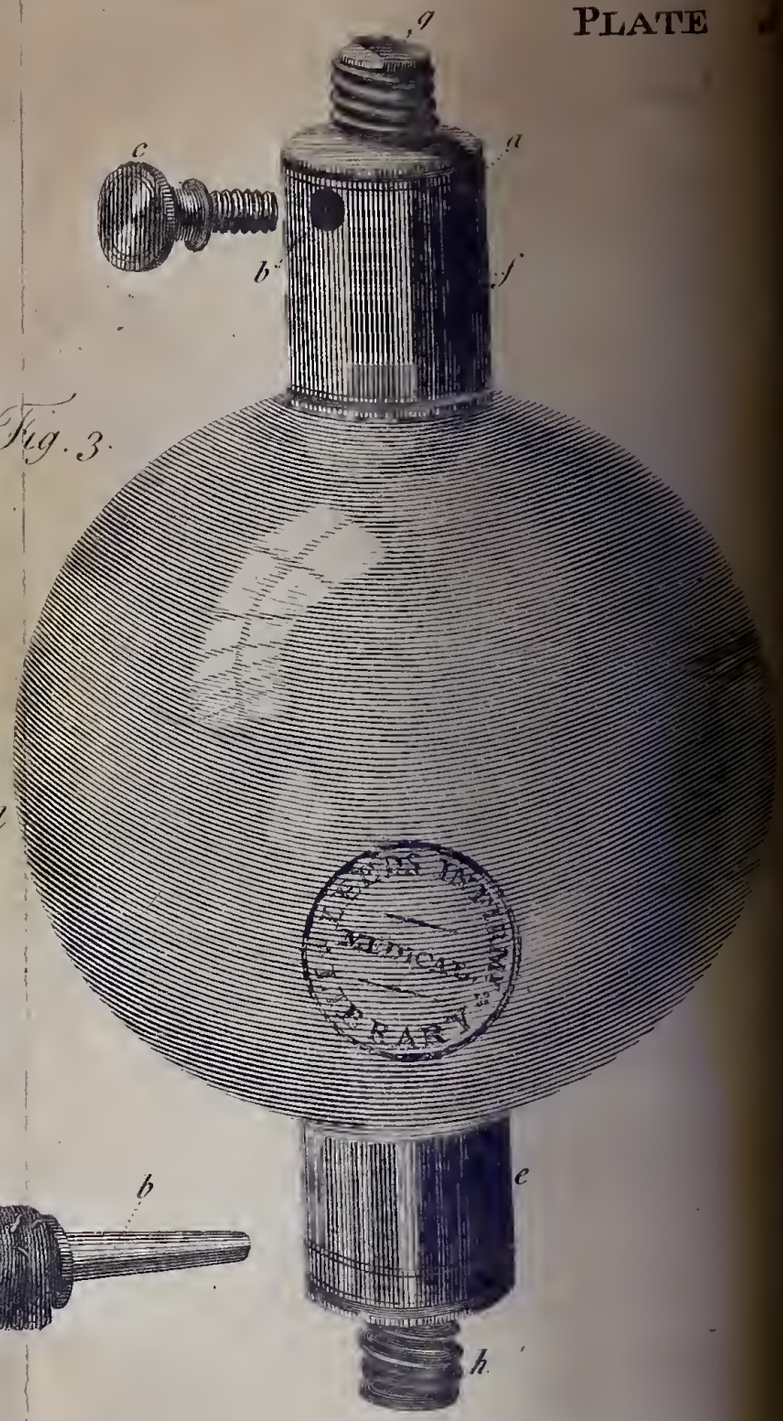
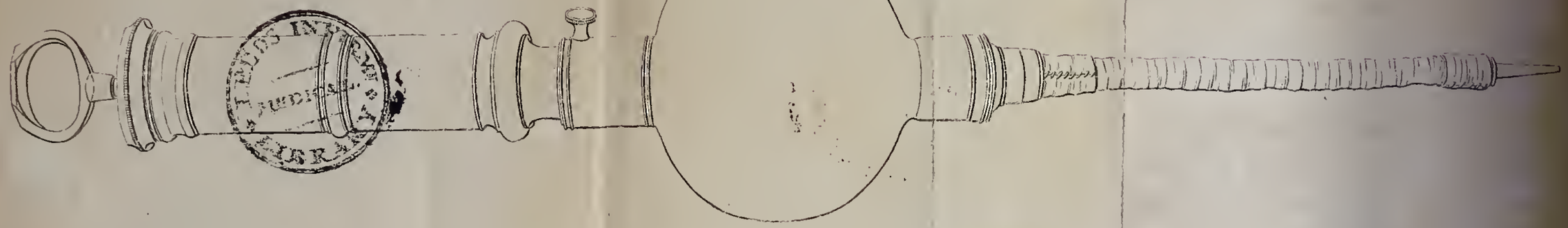


Fig. 4.

Fig. 3.



J. Newton delin.t et sculp.t



DESCRIPTION

OF THE MACHINE

RECOMMENDED IN SECT. XXII. P. 61, 62.

THIS machine conſiſts of an air pump, a glaſs receiver, and a flexible tube terminating in a conical metallic pipe.

When the idea of pumping the urine from the bladder firſt occurred to me, I employed for that purpoſe a common ſyringe, fixed to a catheter, without any flexible tube being interpoſed; and then the jaring occaſioned by working the piſton gave very great pain to the patient. This inconvenience I found means to obviate in a ſubſequent trial, by the addition of a flexible tube.

The advantage of the glaſs-receiver is, that it entirely preſerves the bed clothes, &c. from being ſoiled by the urine; an inconvenience

 which

which I have found extremely diſagreeable, and not to be avoided in uſing a machine which had no receiver.

I have given two plates of the machine; the firſt repreſenting all its parts ſeparately, of their exact ſize; the ſecond ſhewing the machine entire, but upon a contracted ſcale.

In plate I. Fig. 1. repreſents the piſton of the pump, paſſing thro' the top of the cylinder.

Fig. 2. the cylinder, the ſmall end of which is formed into a female ſcrew, and receives the male ſcrew of

The receiver, Fig. 3, which conſiſts of a glaſs globe, to which are joined two perforated braſs collars. In the ſide of the ſuperior one *f* is a hole, which receives a ſcrew *c*, by tightening, or looſening which, the air is excluded from, or admitted into the glaſs globe *d*.

g. A valve covering the hole in the axis of the ſuperior collar.

c. The

c. The inferior collar terminating in a male ſcrew *h*, which is received by a female ſcrew in

Fig. 4. which repreſents the flexible tube made of dog's ſkin leather well coated with varniſh ſo as to be air-tight; to one end of it is fitted a braſs collar *a*. and to the other a conical braſs pipe *b*.

Fig. 5. 6. and 7, repreſent the parts of which the lower end of the piſton of the pump is compoſed; it does not ſeem neceſſary to give a farther deſcription of them.

Plate 2. as before mentioned, gives a view of the machine entire, but repreſented as if reduced to about half its real dimenſions.

The cylinder and piſton are made of braſs.

Mr. Davis, inſtrument-maker, Ruſſel-Court, Drury-lane, has made ſeveral of theſe machines for myſelf and my friends.

I am

I am inclined to believe that the uſe of this, or a ſimilar inſtrument, may be extended to other purpoſes in Surgery, beſide that of emptying the bladder under the circumſtances already deſcribed; for inſtance, to the extrication of any fluid from a cavity, when no depending opening can be procured.---But of this I can as yet ſpeak nothing from experience.

F I N I S.

E R R A T A.

Page 4. line 12. *for* parts *read* part
15. *for* and which *read*, which
19. line 9. *before* cauſe *read* a
44. line 4. *after* be *read* in